

US005629105A

United States Patent [19]

Matthews

5,629,105 [11] Patent Number: [45] Date of Patent: May 13, 1997

[54]		IS AND OTHER BATTERY-	1,669,292		Eckstein .	
	POWERED A	1,671,623		Barany .		
	AND ENERGIZING TRANSDUCERS		1,674,650		Leser .	
			1,680,169		Osean .	
[75]	Inventor: John W. Matthews, Corona del Mar, Calif.		1,680,188		Weber .	
[]			1,781,064			
			1,823,762		Rathmann .	
[73]	Assignee: Laser Products Corporation, Fountain Valley, Calif.				Muros	
[/3]					Meginniss	
			2,020,352		Bolduc	
[21]	Appl. No.:	367,170	2,097,222		Tompkins	
[22]	47		2,125,038	7/1938	Tompkins et al	240/10.66
[22]	PCT Filed:	Nov. 24, 1992		a		
			(List continued on next page.)			
[86]	PCT No.: PCT/US92/10209		FOREIGN PATENT DOCUMENTS			
	§ 371 Date: Jan. 3, 1995					
			138873	4/1984	Australia .	
	§ 102(e) Date:	Ian. 3, 1995	1271830	8/1961	France .	
	4 (-)	·	1430456	1/1966	France .	
[87]	PCT Pub. No.:	WO94/13022	2372382	6/1978		
			411218	6/1934	United Kingdom .	
	PCT Pub. Date: Jun. 9, 1994		555910	9/1943	United Kingdom .	
7513	Int. CL ⁶ H01M 2/10; F21L 7/00; H01R 19/00		586357	3/1947	United Kingdom .	5
[51]			752619	7/1956	United Kingdom .	
[52]	U.S. CL	429/97; 200/60; 200/50.04;	Primary Examiner-Stephen Kalafut			

205, 206

[56] References Cited

U.S. PATENT DOCUMENTS

200/50.04, 60; 362/183, 184, 194, 204,

362/183; 362/184; 362/194; 362/205; 362/206

Re. 29,047	11/1976	Brindley 240/10.67
D. 263,170		Maglica D26/49
D. 297,828	9/1988	Bromley D13/6
D. 298,748	11/1988	Sharrah
D. 303,107	8/1989	Maglica D13/6
D. 306,492		Sharrah
D. 307.488	4/1990	Sharrah
D. 308,109		Maglica D26/49
D. 310.425	9/1990	Sharrah D26/49
D. 312,509	11/1990	Sharrah
D. 324,430	3/1992	Sharrah D26/46
1.403.538	1/1922	Burness .
1,433,570	10/1922	Stimson .
1,603,272	10/1926	Eaton .
1,661,784	3/1928	Blake .

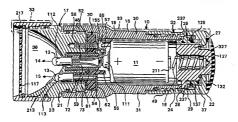
A battery-powered apparatus for holding and energizing an electric transducer, includes a hand-held battery housing carrying the transducer mount, and first and second internal battery contacts. A first external battery charge terminal is on the transducer mount, and a second external battery charge terminal is on a part of the battery housing, such as its end cap. A double-throw switch has a common element electrically connected to an internal battery terminal contact, has a first switched contact leading to a first terminal of the electric transducer, and has opposite second switched contact electrically connected to an external battery charge terminal. If there are two electric transducers, they may be a part of a light source comprising a reflector, a first electric lamp having a filament at its focal point, and a second electric lamp extending into that reflector beside the first electric lamp.

Primary Examiner-Stephen Kalafut

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ABSTRACT

78 Claims, 5 Drawing Sheets



5,629,105 Page 2

U.S. PATENT DOCUMENTS	4,357,648 11/1982 Nelson
	4,388,673 6/1983 Maglica 362/183
2,176,084 10/1939 Lennan 240/10.66	4,398,139 8/1983 Prinsze
2,225,936 12/1940 Williams 240/15.68	4,398,238 8/1983 Nelson
2,259,106 10/1941 Hager 200/60	4.429.351 1/1984 Petzl et al
2,338,078 12/1943 Wood 240/10.66	4,441,142 4/1984 Garofalo
2,339,356 1/1944 Sachs 240/10.69	4,463,283 7/1984 Penney et al
2,385,639 9/1945 Packer et al 240/10.67	4.472.766 9/1984 Hung 362/158
2,439,496 4/1948 Szantay 240/10.68	4,495,551 1/1985 Foltz
2,461,118 2/1949 Lipincott 240/10.68	
2,490,830 12/1949 Norton 240/10.68	4,502,102 2/1985 Phipps
2,503,287 4/1950 Moore 200/60	4,514,790 4/1985 Will
2,518,437 8/1950 Amstutz	4,527,223 7/1985 Maglica
2,520,023 8/1950 Allen 240/10.6	4,530,034 7/1985 Kawarada
2,530,913 11/1950 Shackel 240/10.6	4,531,178 7/1985 Uke
2,599,295 6/1952 Thomas	4,577,263 3/1986 Maglica
2,769,896 11/1956 Lambert	4.581,686 4/1986 Nelson
2,797,309 6/1957 Dulberg	4,605,993 8/1986 Zelina, Jr
2.830.280 4/1958 Webber	4,640,258 2/1987 Penney et al 124/24
2.852.632 9/1958 Garland	4,656,565 4/1987 Maglica
2,852,633 9/1958 Garland 200/60	4,658,336 4/1987 Maglica
2,876,410 3/1959 Fry	4,725,932 2/1988 Gammache
2,897,345 7/1959 Meager et al 240/10.68	4,733,337 3/1988 Bieberstein
2,915,621 12/1959 Garland	4,760,504 7/1988 Schaller
2.931.005 3/1960 Saurwein et al	4.777.582 10/1988 Sharrah
2,945,944 7/1960 Gillespie 240/10.68	4.788.633 11/1988 Zimermann
3,014,125 12/1961 Draudt	4.803.605 2/1989 Schaller
3,226,538 12/1965 Bustamante 240/10.67	4,819,141 4/1989 Maglica
3,250,911 5/1966 Oldenburger 240/10.65	4,823,242 4/1989 Maglica
3,521,050 7/1970 Shagena, Jr 240/10.66	4.825.345 4/1989 Stevens
3,701,862 10/1972 Vignini	4,841,417 6/1989 Maglica
3.717.759 2/1973 Rousseau	4,843,298 6/1989 Branch
3,798,440 3/1974 Brindley 240/10.66	4,851,974 7/1989 Maglica
3.825.740 7/1974 Friedman et al 240/10.6	4.864.474 9/1989 Maglica
3,835,272 9/1974 Wisenbaker 200/60	4,876,416 10/1989 Frantz
3,924,116 12/1975 Brindley 240/10.6	4,885,668 12/1989 Maglica
3,924,117 12/1975 Brindley	4,888,670 12/1989 Sharrah
4,092,580 5/1978 Prinsze 320/2	4.899.265 2/1990 Maglica
4.135.230 1/1979 Armbruster	4.914.555 4/1990 Gammache
4.151.583 4/1979 Miller	4.942.505 7/1990 Maglica
4,171,534 10/1979 Strowe	4,956,755 9/1990 Maglica
4203.150 5/1980 Shamlian	5,003,440 3/1991 Maglica
4,234,913 11/1980 Ramme	5,008,785 4/1991 Maglica
4244.011 1/1981 Hammel et al	5.113.326 5/1992 Maglica
4261,026 4/1981 Bolha	5.143.441 9/1992 Maglica
4281.368 7/1981 Humbert	5,158,358 10/1992 Maglica
4,286,311 8/1981 Maglica	5,161,095 11/1992 Gammache
4.327.401 4/1982 Siibere	5.171.086 12/1992 Baloochi
4,329,740 5/1982 Colvin	5,203,624 4/1993 Schier et al
4,345,304 8/1982 Penney et al	5,422,798 6/1995 Oslecki et al